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ABSTRACT

Described is an evaluation of a career development institute on the images of the future of 191 gifted adolescents. It is explained that the institute provided opportunity for individual study of specific areas of societal problems, career opportunities in these problem areas, and varied methods of solving the problems. The two broad areas focused on in the institute are said to be social and political culture and science and technology. Results of pre- and post-test measures of Thinking Creatively About the Future indicated that the institute enriched the Ss' future images and made them more aware of the realities of the post industrial world. (CL)

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EFFECTS OF A CAREER DEVELOPMENT INSTITUTE ON THE IMAGES OF THE FUTURE OF GIFTED ADOLESCENTS

E. Paul Torrance, Felice Kaufmann, and Marcia Hallford

There is considerable evidence that:
Gifted students' images of the future determine what they will be motivated to learn and do.
Their images of the future influence their ability to live, cope, and grow in a high-change society.
Images of the future are necessary to gifted young people in their search for identity.
Gifted students' images of the future write in advance a considerable part of the history of the future.

Scholars such a Alvin Toffler (1974) believe we have reached a stage of development in which a large part of education must involve processes by which we enlarge, enrich, and improve students' images of the future. Scholars such as Polak (1973) provide impressive evidence for making this one of the major goals of special programs for educating gifted and talented students. In his research Polak has shown that throughout history, advances in civilization have been guided and spurred by the images of the future of its gifted and talented members.

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He contends that our gifted and talented people (our prophets and projectors of images) write in advance a big part of the history of the future. He has made a particular point of the fact that "images of the future are always aristocratic in origin" (p. 13). He has argued that the authors of the images of the future that change the world come from a creative minority. Throughout history there has been a positive image of the future in every instance of the flowering of a culture and weakened images of the future as a primary factor in the decay of cultures. Polak believes that the potential strength of a culture can be measured by measuring the intensity and energy of its images of the future.

This was a part of our challenge in evaluating the program of the 1976 Career Development Institute of the Governor's Honors Program in Georgia. It gave us an opportunity to find out something about the intensity and strength of the images of the future of Georgia's gifted and talented adolescents and about the extent to which these images could be enlarged and enriched and made more accurate.

First, let us look at the nature of the program and then at the instruments through which we tried to measure the intensity and energy of their images of the future and changes in these images.

The Georgia Career Development Institute

Overview

The essence of the philosophy of the Institute of Career Development, Summer 1976 centered around providing unique and unusual opportunities to motivate 200 of Georgia's Gifted and Talented to use and develop their

academic abilities and interests in life and their artistic potentials through enlarged and concentrated studies of careers in current critical problem areas.

The Institute of Career Development was based upon the fundamental concept that each student is unique with different needs, abilities, and interests. In order for these abilities and interests to be developed, the curriculum designed for this program permitted individual study of specific constructs of societal problems, the multitude of career opportunities available in these problem areas, and the varied methods of seeking solutions to these problems. This program differed from that of the regularly structured program in the amount of freedom which was allowed to a small and highly motivated group of selected students of comparable abilities for independent study and pursuits of projects of interest. This program offered the student the opportunity to develop one or more personal career competencies through planned experiences as an individual and through interaction with others as needed. The program was designed around two broad areas cited below, students being interchanged at mid-term, with sub-topics of critical life and civic survival.

Curriculum Design

The Institute of Career Development participants studied two broad areas of curricular emphases and identified critical areas of living, present and foreseeable future. The major thrust was to study the lives of individuals, personal and professional, who are employed in these fields and who lead fulfilling lives in these careers. The Institute provided the following learning experiences:

1. An interdisciplinary study of The Development of Western Man's Social and Political Culture with emphasis on
   a. Governmental Functions and Tasks
   b. The Economics of the Free Enterprise System
   c. Ideas of Men and the Effects of These Ideas on Man's Culture
   d. Man's Environment and How Man Uses His Environment to Meet His Needs
   e. Man's Physical and Mental Health Problems
2. An interdisciplinary study of The Scientific and Technological Implications for the 21st Century Man with emphasis on
   a. Scientific Advancements in Medical and Health Fields
      1. Aging
      2. The "Have" and "Have Not" Worlds
      3. Advancement in Medical Science
      4. Educational Problems Affecting the Masses
   b. 1. Business Fields (Industry) - Human Problems are included
         Construction
         Automotive
         Pollution
      2. Criminal Detention and Penal Correction
      3. Education of the Public through Mass Media
      4. Family Life Values Patterns

A block of time of two (2) hours per day was allotted to the study of these critical problem areas.

Other Procedures

A second block of time of approximately two (2) hours was devoted to the study of ideas, broadening content and depth of content in the disciplines represented: Art, English, Language Arts, French, Mathematics, Music, Social Studies, and Science. A third block of time, from 1 p.m. to 5 p.m., was taken by one half of the students to study careers in the problem areas cited above and in any other field the student chose; to spend a week in the field "shadowing" persons employed in the critical areas; to spend a third week in seminars sharing, analyzing, and planning from all their study and observation.

While these students were in these career study tasks, the other one hundred students were enrolled in some fifty or more Interest Studies planned upon faculty and student competencies and interests. Student research topics were conducted and shared in student conducted seminar days. At the end of three weeks, the 100 student teams exchanged the two activities in this long block of time.

Beginning at 6 a.m., for two hours, and ending in the twilight hours, there was a multiplicity of life time sports: tennis, jogging, golf, softball, volleyball, badminton, archery, swimming, bicycling, weight lifting, hiking, or whatever planned by staff and students. All staff members usually participated also.

The night hours to 11 p.m. had constant activities, staff or student planned, such as visiting speakers, intra murals, band, ensemble, choral presentations, reading, personal research, book reviews by students, staff, or outside persons, group task meetings, student-staff discussion, viewing

of unique films, and many dramatic presentations including student produced television tapes.

The curriculum content and activities avoids the typical high school curriculum. Lectures were minimal; seminars, small group and individual research, carefully planned media presentations, and teacher-pupil planning were stressed. Typical activities are as follows:

Independent Study
Industrial Field Trips
On-Hand Experience
Journalism
TV-Radio
Social
Vocational-Technical Schools
Interviewing Correctional Institute Personnel
Government Officials Seminars and Visits to Agencies
Research Techniques on Private Enterprises
Visits to Health Facilities
Small Business Surveys and Investigations into Management Design
Labor Force Surveys - Designs, Commercial and Governmental
Publication of Newspaper
Mass Media Activities
Other Activities as Recommended by the Staff
College Nights

Instruments for Assessing Images and Changes

A rather comprehensive evaluation program was designed by Kaufmann and Torrance assisted by the planners and staff of the Career Development Institute (Torrance, Kaufmann, Gibbs, & Torrance, 1976). However, we shall be concerned here only with a creative thinking test, Thinking Creatively About the Future, and scenarios and soliloquies of future careers in the year 2001.

A major psychological problem involved in developing instruments for studying students' images of the future and developing more accurate

concepts of the future is one of finding time spanners to elicit and enhance their sense of the future. Toffler (1970) recognized this problem and described some of his own experiments in developing devices to get students to express their images of the future. He also made some suggestions for enhancing students' sense of the future. He points out that there are no time spanners in our ordinary environment for enhancing a sense of the future as there are for the past and present. There are, he asserts, no objects, no friends, no relatives, no works of art, no music or literature, that originate in the future. He assures us, however, that there are ways to "send the human mind arching forward as well as backward" (p. 423).

Torrance's alternate forms test, Thinking Creatively About the Future, and the scenarios and soliloquies of future careers are among the more successful "time spanners" that we have developed for this purpose. The following instructions for Thinking Creatively About the Future illustrates one approach to "spanning time":

> This is an invitation to think creatively about the future! In this booklet, you will find three problems based on future predictions. You are to imagine that the prediction has "come true" and to suggest possible alternative solutions. Use your imagination and think in terms of possibilities. Do not wait to weigh the probabilities. Concentrate on producing as many ideas as you can. Do not be afraid to guess. No one can really know, so there are no "wrong" answers.

One of the test tasks gives a future prediction and asks the respondent to think of its possible consequences; a second asks the respondent to produce solutions to a future problem; and the third asks for alternative ways of implementing a particular kind of solution. The following is an example of the instructions given for the third type of problem:

> There is considerable evidence to indicate that criminals are compelled by certain physical stimuli, either internal or external, to perform criminal acts. It is being argued already that criminals should be regarded as sick persons with a disease for which they have to be treated. Already there has been considerable success with treatment methods and evidence is accumulating to indicate that criminal behavior is a brain malfunction which is curable. In what ways might motivation be developed to eliminate criminal punishment by imprisonment for extended periods of time and by the execution of selected criminals and replace it by a system of treating the brain malfunction? List as many ideas for accomplishing this as possible. Use the space below and on the back of this page for your responses.

During the first week of the program, participants were administered the future career narrative plan and the scenario along with several other instruments. During the final week, participants were assigned randomly to write scenarios and soliloquies as a part of the total evaluation program.

In the pre-test, the instructions for the narrative career plan and scenario were as follows:

Occupational daydreams

List below the occupations you have considered in thinking of your future career. List the occupations you have daydreamed about as well as those you have discussed with others. Try to give a kind of history to your list. On line 1, place your most recent and most likely choices and end with some of your wildest day reams.

Your future projected career

Let's suppose you do decide upon the choice listed above on the first line. Describe specifically the kind of work you would like to be doing 25 years from now. What specific roles, activities, etc. would you like to be engaged in?

Getting there--

As you see matters now, what do you think you would need to do to prepare for and advance to the career you have just described? What kinds of educational, work, and personal growth experiences would you need? Try to list these things in the sequence in which they would probably need to take place.

You are there!--Year 2001

Write a scenario of a day or week in your life as it might occur in the year 2001. A scenario is simply a description of a sequence of events that might possibly happen in the future. A scenario is usually developed by studying the

facts of a situation and selecting a development that might occur, and imagining the range and sequence of events that might follow. Use the facts you have about yourself, the occupation you have described, and the future and try to imagine a specific day or week in the year 2001. Describe what you will be doing, where you will be, whom you will be with, what will be happening in the world, and how you will feel about all of these things.

The instructions for the post-test scenario were as follows:

In the program here at Governor's Honors, you have thought a great deal about what you want to accomplish in life--your mission. You thought about the kind of work you want to do in the future, what you want to produce. You have thought about the kinds of knowledge and skills you want to acquire during your life. You have thought about what you want to accomplish in regard to your family, your community, society, and the like.

Imagine that it is now the year 2001 and write a scenario of a day or week in your life as it might occur in the year 2001. A scenario is usually developed by studying the facts of a situation and selecting a development that might occur, and imagining the range and sequence of events that might follow. Use the facts that you now have about yourself, the ways you want to change,

predictions about future changes in technology and society, and try to describe a specific day or week in your future.

In writing your scenario, use the present and past tenses and not the future. Imagine that your future is here. Your scenario should reflect what you have accomplished, what kind of life you are living, what you have produced. It should reflect the changes that have occurred in yourself and in the world.

The first paragraph of the instructions for writing the soliloquy was the same as for the scenario. The remainder of the instructions were as follows:

Now, it is the summer of 2001, 25 years later, and you have been thinking about what you have accomplished. Write a soliloquy describing what you have accomplished. In a soliloquy, one reminisces not only about what he/she has done but also about how he has felt and now feels about these accomplishments, those secret feelings, hopes and dreams. Your soliloquy should reflect not only what you are doing but what is happening in the world at the time, how you have changed and how the world has changed.

In all cases, there was a time limit of 25 minutes for the writing of the scenarios and soliloquies.

Study Participants

A total of 196 students in the Career Development Institute participated in the initial testing at the beginning of the program and 191 participated at the end of the program. The 191 subjects were distributed among areas of specialization as follows: art, 16; drama, 9; English, 33; foreign languages, 12; mathematics, 31; music, 36; natural sciences, 22; and social sciences, 32. There were 87 males and 104 females. The post-test scenario and soliloquy were also administered to a sample of 138 students in the regular Governor's Honors Program according to the same instructions and time limits.

Analysis of Data

The pre- and post-test responses to Thinking Creatively About the Future (1977) were scored first for fluency and originality according to the manual devised by Torrance. They were then analyzed qualitatively for the nature of the difficulties encountered by the respondents in "spanning time" and in producing and considering alternative futures.

Each of the narrative future career plans, scenarios, and soliloquies was rated on a scale from one to nine on each of the following criteria:

1. Expressed satisfaction with future career
2. Perception of self as changed
3. Perception of world/mankind as changed
4. Heightened consciousness of trying to do something to make the world better/solve future problems
5. Originality, imagination, and involvement
6. Awareness of future problems/characteristics of post industrial society

7. Solutions to future problems proposed

8. Perception of self as a creative, problem-solving person.

Each future projection was also analyzed for the presence of each of the following characteristics or concerns:

1. Unconventional career
2. Change in governmental functions and tasks
3. Changes in free enterprise system
4. Ideas of man and their influence on life/culture
5. Environment and its use to meet human needs
6. Physical and mental health
7. Aging
8. Poverty
9. Medical science
10. Educational problems
11. Crime and criminal rehabilitation
12. Leisure time activities
13. Mass media problems
14. Future solutions through careers
15. Increased interdependence of people
16. Families and family problems
17. Knowledge as source of power, production of knowledge
18. Limitedness of resources
19. Unemployment.

Findings

Since the concern of this paper is with changes in images of the future, attention will be given only to the findings derived from Thinking Creatively About the Future and the scenarios and soliloquies.

Both the pre- and post-tests from Thinking Creatively About the Future emphasized the use of new breakthroughs to help improve personal functioning. The breakthroughs included predicted psychological and technological advances. Respondents were asked to brainstorm ways of implementing these breakthroughs to improve personal and societal functioning. Both problems involve inhibiting prejudices and public attitudes. The image of the future held by the respondent may either facilitate or inhibit the production of alternative ideas.

The means and standard deviations for the measures of both fluency and originality on the pre- and post-test are shown in Table 1. The differences in means were tested for statistical significance by means of the correlated t-test.

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Insert Table 1 about here

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The Institute participants scored markedly higher on both fluency and originality of alternatives on the posttest than on the pretest.

Many respondents did a surprisingly outstanding job of proposing alternative procedures for using psychological and technological breakthroughs to improve human mental functioning. Their proposals

reflected considerable information regarding these developments, an understanding of their implications, and mature sophisticated thinking about possible solutions. Many of them, however, indicated a type of thinking that has been held in the past among some groups concerning medical, surgical, and psychological intervention in common physical illnesses such as appendicitis, cancer, pneumonia, and the like. The following excerpts illustrate this type of block to a richer and more accurate future image:

> I believe that the mind is a gift from God and we should not try to make His work better. And on the practical side, in order to establish methods for improving intelligence there would have to be experimentation on the human mind. There is no person in the world that has the right to take a chance on the mentality (and in my opinion, the very meaning of life) of another person.

Another wrote as follows:

> If God had wanted us to have greater intelligence He'd have given it to us Himself. Having too much intelligence is as bad as having little or no intelligence.

Many responses reflected a great fear of the dangers of being too intelligent. The following responses reflect some of these fears:

> A better memory would cause more mental illness.
>
> We would have too many different opinions.
>
> Too much intelligence eliminates common sense.

> If we lived in a world filled with geniuses, who would do the manual labor and carry the work load? I think the world would be boring if everybody was intelligent.

Some respondents expressed the belief that the use of psychological and technological means to improve mental functioning would cause people to lose their individuality, their personality, and that human differences would disappear. This belief is reflected in the following response:

> I feel that society could not last if everyone operated on the same basic level of intellect. All this would do is pave the way for argument on a greater level than what we have now, and eventually lead to destruction. I feel that the beauty of mankind is found in individual ideas and personalities and shouldn't be lost in uniformity

Although many respondents were overwhelmed by the threat of increased intelligence, improvement of memory, etc., the majority dealt with the problem without feelings of threat. Some even dealt with it with humor. Even some of the opponents of implementation gave humane and appealing arguments, as in the following response:

> Remember how much fun you had in grade school making new friends and finding out things at your own pace, trying to keep up with Ken that smart guy that you knew ought to be dumber than you? Well, this genetic engineering is going to take all sense of competition out of this thing called learning, this precious

process that has been preserved through all these years, and that's a rip off.

Now, let us examine some of the findings from the scenarios and soliloquies of future careers. Comparisons of the pretest narrative accounts indicated very clearly that the scenario technique is superior for eliciting information about images of the future. Comparisons of the posttest scenarios and soliloquies revealed few differences. In general, the soliloquies seemed to be superior to the scenarios in eliciting feelings about the future and the scenarios seemed to be superior in eliciting descriptions of actions and events.

Table 2 presents a comparison of the ratings made on the pre- and post-test scenarios of participants in the Institute together with the results of correlated t-tests of the significance of the differences in means.

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Insert Table 2 about here

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It will be noted that very clear differences occurred in the pre- and post-test scenarios on all of the variables rated. On the basis of these findings, it would appear that participants in the Institute developed more positive expectations concerning their future careers; became more likely to see themselves as changed or changing in the future; recognized changes that are likely to occur in the world or in mankind; developed a heightened consciousness of doing something to make

a better world; showed more originality, imagination, and involvement in thinking about their future careers; became more aware of the problems of our post industrial society; were better able to propose alternative solutions to future problems; and developed greater confidence in themselves as creative persons.

Participants in the regular Governor's Honors Program provided an excellent control group. They were selected on essentially the same criteria. A major difference in the two programs was the emphasis of the Institute program on career education and future studies. A random sample of 138 participants in the regular Governor's Honors Program was administered the scenarios and soliloquies with the same instructions as the Institute participants. Table 3 presents the results of the comparison between the two groups on the posttest.

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Insert Table 3 about here

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It will be noted that there was a consistent tendency for the Institute group to excel the regular Governor's Honors group on all of the variables rated. All of the differences are significant at better than the one percent level except for perceptions of the world/mankind as changed or changing. Thus, it would appear that the career education and future emphases of the Institute of Career Development resulted in greater anticipated satisfaction with future career prospects; perception of self as changed or changing; heightened consciousness of doing something to help solve future problems; originality and involvement;

awareness of future problems, production of alternative solutions of future problems and confidence in oneself as a creative person.

To compare the characteristics of the pre- and post-test scenarios, a value of 1 was assigned for an absence of the characteristic and a value of 2 for its presence. Differences in means were then tested by means of the correlated t-test. For ease of interpretation, the results in Table 4 are reported in terms of percentage of occurrence. Tests of

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Insert Table 4 about here

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significance, however, are based on means and correlated t-tests were used.

It seems reasonable to expect that the emergence of a characteristic such as concern for poverty and hunger indicates that the writer of the scenario had a consciousness or concern about problems of poverty and hunger. Thus, if a concern about poverty and hunger appears more commonly in the posttest scenarios than in the pretest scenarios, it seems reasonable to infer that the experience heightened the consciousness of the group concerning poverty and hunger. In the present case, however, there was relatively little consciousness of poverty and hunger in either the pretest or posttest scenarios (3% in the pretest and 7% in the posttest) and the difference was not statistically significant. A number of statistically significant differences did emerge, however. There was significantly less consciousness of leisure time activities in the pretest than in the posttest. However, there seems to have been increased consciousness about changes in government functions and tasks, changes in the free enter-

prise system, the influence of people's ideas on life and culture, the environment and its use to meet people's needs, medical problems and advances, the solution of future problems through careers, interdependence among the peoples of the world, knowledge as a source of power, the limitedness of natural resources, and unemployment. It is especially striking that initially there had been almost no consciousness expressed concerning possible changes in our free enterprise system and problems of unemployment. Consciousness of these matters was still infrequent but certainly more frequent than initially observed.

It is also possible to compare these characteristics as observed in the Institute group with their controls in the regular Governor's Honors Program. Since we are comparing independent rather than correlated groups, it was not necessary to compare means. Thus, the chi-square test was used in testing the statistical significance of differences between the Institute group and their controls. The comparative data are shown in Table 5.

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Insert Table 5 about here

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Generally these characteristics tended to occur more frequently in the scenarios and soliloquies of Institute participants than in those of their controls. The Institute participants expressed more frequent consciousness of physical and mental health problems, educational problems, possibility of future solutions through careers,

increased interdependence among peoples, and knowledge as source of power.

In summary, it seems fairly clear that the career education and future emphases of the Institute of Career Development enriched the future images of the participants and made them more aware of many of the realities of the post industrial society.

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Table 1

Comparison of Pre- and Posttest Performance on Thinking Creatively about the Future

Measure	Number	Pretest Mean	Pretest St. Dev.	Posttest Mean	Posttest St. Dev.	t-ratio
Fluency	191	3.15	2.60	6.69	3.79	9.29*
Originality	191	6.72	6.22	12.52	8.31	7.56*

* Difference in means significant at .001 level

Table 2

Comparison of Pre- and Posttest Scenarios of Institute Participants on Rated Variables (N = 94)

Variable	Pre Mean	Pre St.Dev.	Post Mean	Post St.Dev.	t-ratio
Anticipated satisfaction with future career	6.14	1.54	8.13	1.52	9.32*
Perception of self as changed (ing)	4.40	1.70	6.93	2.55	9.27*
Perception of world as changed (ing)	2.79	2.21	6.21	3.37	9.79*
Heightened consciousness of doing something to make world better/solve future problems	3.24	2.28	5.99	2.93	9.21*
Originality, imagination involvement	3.98	1.81	6.63	2.67	9.21*
Awareness of future problems/ post industrial society	2.05	1.50	5.40	3.12	11.00*
Solution(s) to future problem(s) proposed	1.85	1.35	5.42	3.09	11.75*
Perception of self as a creative person	4.58	1.85	6.93	2.41	9.07*

* Significant at .01 level

Table 3

Comparison of Posttest Scenarios and Soliloquies of Institute Participants (N = 191) and Controls (N = 138)

Variable	Institute Mean	Institute St.Dev.	Control Mean	Control St. Dev.	t-ratio
Anticipated satisfaction with future career	8.26	1.47	7.00	2.66	5.04*
Perception of self as changed	7.31	2.19	5.93	2.88	4.73*
Perception of world/mankind as changed(ing)	6.30	3.19	5.70	3.34	1.66
Heightened consciousness of doing something to make world better/solve future problems	6.15	2.93	4.04	3.11	6.21*
Originality, imagination, involvement	6.41	2.55	5.06	2.60	4.70*
Awareness of future problems/ post industrial society	5.41	2.98	4.09	2.87	4.03*
Solution(s) of future problems proposed	5.27	3.00	3.03	2.68	7.10*
Perception of self as a creative person	6.89	2.31	5.04	3.07	5.98*

* Significant at less than the .01 level

Table 4

Comparison of Characteristics of Pre- and Posttest Scenarios of Participants in Institute of Career Development (N = 94)

Characteristic	Percent Pre	Percent Post	t-ratio
Unconventional career in terms of present occupations	36	38	0.33
Changes in governmental functions and tasks	3	18	3.49*
Changes in free enterprise system	0	11	99.00*
Influence of ideas of people on life, culture	8	40	6.03*
Environment and its use to meet needs of people	9	37	4.99*
Physical and mental health concerns	24	33	1.52
Aging, care of aged	3	8	1.68
Poverty, hunger, etc.	3	7	1.42
Medical problems and advances	7	19	2.76*
Educational problems	12	18	1.51
Criminal detection and correction	6	3	-1.35
Leisure time activities	35	20	-2.55*
Mass media problems	3	8	1.68
Future solutions through careers	8	37	4.22*
Interdependence among peoples	1	16	3.73*
Families, forms, problems	32	44	1.92
Knowledge as source of power	8	41	5.95*
Limitedness of natural resources	3	27	4.94*
Unemployment	0	5	99.00*

* Differences in means significant at .01 level

Table 5

Comparison of Characteristics of Posttest Scenarios and Soliloquies of Participants in Institute of Career Development (N = 191) and Controls (N = 138)

Characteristic	Percent Institute	Control	X^2
Unconventional career in terms of present occupations	37	32	---
Changes in governmental functions and tasks	20	21	---
Changes in free enterprise system	11	6	---
Influence of ideas of people on life, culture	33	27	---
Environment and its use to meet needs	31	31	---
Physical and mental health concerns	36	19	11.03*
Aging and care of aged	7	5	---
Poverty, hunger, etc.	11	6	---
Medical problems and advances	15	9	---
Educational problems	27	12	11.26*
Criminal detection and correction	3	5	---
Leisure time activities	17	9	4.49**
Mass media problems	5	5	---
Future solutions through careers	39	16	20.17*
Interdependence among peoples	22	6	7.71*
Families, forms, problems, etc.	43	53	---
Knowledge as source of power	35	16	13.66*
Limitedness of natural resources	22	16	---
Unemployment	7	5	---

* Significant at the .01 level
** Significant at the .05 level